

U.S. Patent Application Serial No. 10/030,095
Amendment dated February 27, 2004
Reply to OA of **October 27, 2003**

REMARKS

Claims 4-8 and 11-15, are pending in this application. Claims 4-8 and 10-12, have been rejected.

Claim 10 has been canceled without prejudice or disclaimer and has been rewritten as new claim 13 to more clearly define the invention. Specifically, claim 13 has been written to replace the term "fractional" with the term "gradient".

Claim 14 has been newly added and requires that the barrier layer not contain a polyamide. New claim 15 is similar to claim 13 and requires that the barrier layer "consists of" the recited components. Support for new claim 15 appears in the Examples on pages 15-17, the specification at page 5, lines 16-18 and 22-24, page 12, and in the Figures.

Claim 8 has been amended to be properly dependent on claim 7. Claims 11 and 12 have been amended to properly recite an "adhesive component" in place of an "adhesive layer". The remaining claims have been amended as appropriate, to conform to the new claims.

No new matter has been added.

It is believed that this Amendment is fully responsive to the Office Action dated **October 27, 2003**.

In view of new claims 13 and 14, the amendments to the claims, and the remarks set forth below, further and favorable consideration is respectfully requested.

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I. At page 2, paragraph 3, of the Office Action, claims 4-8 and 10-12, have been rejected under 35 USC § 112, second paragraph, as being indefinite.

The Examiner states that the term “fractional” is indefinite as its meaning is unclear, and that for the purposed of examination, the term is assumed to refer to any layer.

It is clear that the term “fractional” means “a part of” and is used to distinguish the layers making up the barrier layer (which is a composite layer of several “fractional layers”) from the body layer and the barrier layer itself, in claim 10. The term “fractional” is descriptive of the layers, each layer making up a fraction of the composite barrier layer.

However, to overcome this rejection, claim 10 has been canceled and rewritten as new claim 13 to replace the term “fractional” with the term “gradient”, and to more clearly set forth the claimed invention. The term “gradient” finds support throughout the specification and claims as originally filed. For example, please see the specification at page 5, line 23, page 6, lines 1-2, 7-8, and 18, page 7, line 18, and page 13, line 3. No new matter has been added.

In view of the new claims, it is submitted that the claims are clear and definite within the meaning of 35 USC § 112, second paragraph. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

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II. *At page 3, paragraph 5, of the Office Action, the Examiner rejects claims 4-6 and 10-12, as being unpatentable over Hunter (US Pat No: 5,891,373) in view of Spohn (US Pat. No: 6,127,478).*

The Examiner states that it would have been obvious to the skilled artisan to have provided Hunter with an innermost barrier layer as taught by Spohn, in order to make a fuel hose which is resistant to chemical attack as taught by Spohn. The Examiner states that Hunter fails to disclose an inside layer which is a barrier layer. A brief analysis of Hunter and Spohn is set forth below.

Hunter is directed to a process for making a multi-layer tube, where the tube includes an outermost protective layer, an inner hydrocarbon barrier layer, and a first and a second compatibilizing adhesive layer. When the tube is used for fuel lines, Hunter discloses that it includes a conductive inner layer (see Hunter at col. 2, lines 64-65, and the Example at col. 3). The outer protective layer is nylon, the first and second compatibilizing layers are ETFE blended with nylon, the barrier layer is non-conductive ETFE, and the optional inner conductive layer is conductive ETFE.

It is submitted that Hunter does in fact, disclose a barrier layer. Hunter discloses a non-conductive ETFE barrier layer and an innermost ETFE conductive layer when the tube is a fuel line. The adhesive layers of Hunter are intermediate layers (see the abstract, lines 1-3, Fig. 2, col. 1, lines 35-39, lines 66-67 to col. 2, lines 1-5). Hunter does not teach or suggest that the intermediate adhesive layers are useful as barrier layers. Rather, Hunter ***requires*** a non-conductive ETFE barrier layer and an optional ETFE conductive barrier layer. See the abstract, claim 1, the Example,

Hunter requires that the first adhesive compatibilizing layer contain more nylon than ETFE in order to promote adhesion to the outer nylon layer, and that the second adhesive compatibilizing layer contain more ETFE than nylon in order to promote adhesion to the inner ETFE non-conductive barrier layer. Hunter states at col. 1, lines 35-37, that "The...a polyamide or nylon outer layer can be laminated to a fluorinated polymer inner layer by a dual adhesive layer."

In conclusion, Hunter teaches a multilayer tube, and **requires** a polyamide/nylon outer layer, an inner barrier layer and two adhesive layers, where the two adhesive layers are provided in order to prevent prior art problems including delamination.

Spohn is directed to blends of grafted fluoropolymer and polyamide where the blends can bond to fluoropolymer or polyamide **without** an intervening adhesive layer (see the abstract, lines 3-4). At col. 2, lines 13-15, Spohn discloses "In such composites, a separate adhesive layer is **no longer necessary** to adhere the components together." (Emphasis added). Further, Examples 5 and 6, are directed to transport or fuel lines, and include only two layers, an inner blend layer and an outer nylon layer. The blend includes polyamide as the matrix and fluoropolymer having polar functionality, dispersed in the polyamide matrix.

Spohn discloses that suitable polyamides include various nylons. Spohn discloses that fluoropolymers are polar-grafted and the resultant polar-grafted fluoropolymers form a dispersed phase of the blend, i.e., dispersed in the polyamide matrix. Spohn discloses that the blend is advantageous because it can adhere to a co-extruded layer of another polymer which is a fluoropolymer or a polyamide.

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In conclusion, Spohn teaches a blend of polar-grafted fluoropolymer and nylon, optionally containing fluoropolymer, which has utility as a barrier due to its chemical resistance, with the advantage that when used in composite structures such as fuel lines, it eliminates the necessity of an intervening adhesive layer. Spohn *requires* polyamide in the blend.

In view of the following, this rejection is respectfully overcome.

Present claim 13 requires a resin tube for use as a fuel line, including a body layer and a multi-layer barrier layer where the innermost layer of the barrier layer is the inside surface of the tube, and where the concentration of the adhesive component decreases from the outermost layer to the innermost layer of the barrier layer, and the concentration of the barrier component increases from the outermost to the innermost layer of the barrier layer.

New claim 14 requires that the barrier layer not contain a polyamide. Support for this claim appears in the Example set forth at page 15 of the specification, where polyamide (nylon 12) is present in the body layer, but is not present in the outer and inner barrier layers.

New claim 15 is similar to claim 13, and requires that the barrier layer “consists of” the recited components. Claim 15 excludes polyamide/nylon from the barrier layer. Support for this claim appears in the specification, claims as originally filed, and in the Examples.

MPEP 2143 discusses the requirements of a *prima facie* case of obviousness. First there must be some suggestion or motivation to combine the reference teachings or to modify the reference, and second there must be a reasonable expectation of success. Finally, the prior art reference or references when properly combined, must teach or suggest all the claim limitations.

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MPEP 2143.01 states that there are three possible sources for a motivation to combine references: the nature of the problem being solved, the teachings of the prior art, and the knowledge of one of ordinary skill in the art. Further, MPEP 2145 (X)(D)(2) states that "It is improper to combine references *where the references teach away from their combination.*" (Emphasis added).

This section quotes *In re Grasselli*, 713 F.2d 731 (Fed. Cir. 1983) which court held that a claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from, and adding iron to, a catalyst.

A combination of references may teach every element of a claimed invention, but without a motivation to combine the references, a rejection based on a *prima facie* case of obvious was held improper. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998).

Further, where the prior art conflicts, all teachings must be considered. The fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness. MPEP 2143.01 further states that a proposed modification cannot render the prior art unsatisfactory for its intended purpose. If it does, then there is no suggestion or motivation to make the proposed modification. Further, the proposed modification cannot change the principle operation of a reference.

MPEP 2141.02 states that prior art must be considered in its entirety, including disclosures that teach away from the claims. See also MPEP 2145 (X)(D).

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It is submitted that the combination of Hunter with Spohn is improper because there is no motivation, suggestion or incentive supporting the combination. Specifically, Hunter requires two adhesive layers in order to solve prior art problems of delamination. Hunter *teaches away* from any construct not containing two such layers. Spohn teaches a blend, where the blend is advantageous over the prior art because it can be used as a barrier *without* the use of adhesive layers. Accordingly, Spohn *teaches away* from constructs containing adhesive layers. Hunter and Spohn *teach away* from each other.

Assuming *arguendo* the combination proper, Hunter and Spohn suggest, at most, replacing the barrier and adhesive layers of Hunter with the blend of Spohn, since Spohn teaches that the blend is useful as a barrier and is used without intervening adhesive layers. This would result in a construct having an outermost nylon layer (Hunter) and an innermost single-layer, barrier layer (Spohn's blend).

Nothing in Hunter and/or Spohn, suggest providing the blend of Spohn as an inside barrier layer, on the inner surface of Hunter's tube where Hunter's tube retains the adhesive layers. The advantage of Spohn is the elimination of intermediate adhesive layers.

Further, assuming *arguendo* that Hunter and Spohn provided such suggestion, the present invention would not be produced. Rather, a construct having an outer nylon layer, two nylon-fluoropolymer adhesive layers, a blend barrier layer (Spohn), and a conductive inner layer, would be produced. Again, Hunter requires a conductive inner layer when the tube is a fuel line.

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Accordingly, it is submitted that nothing in Hunter and Spohn, taken alone or together, suggest a resin tube including a body layer and a multi-layer barrier layer where the innermost layer of the barrier layer is the inside surface of the tube, and where the concentration of the adhesive component decreases from the outermost layer to the innermost layer of the barrier layer, and the concentration of the barrier component increases from the outermost to the innermost layer of the barrier layer, as presently required.

New claims 14 and 15 exclude polyamide/nylon from the barrier layer. Spohn *requires* polyamide/nylon in the barrier blend. Spohn does not teach or suggest a construct absent polyamide/nylon in the barrier blend, as required by present claims 14 and 15.

In view of the new claims, amendments to the claims and arguments set forth above, it is submitted that a *prima facie* case of obviousness has not been established. Further, it is submitted that nothing in Hunter and Spohn, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

IV. At page 4, paragraph 6, of the Office Action, claims 7 and 8 have been rejected under 35 USC § 103 (a) as being unpatentable over Hunter in view of Spohn, and further in view of Yokoe et al. (US Pat. No: 5,919,326).

The Examiner states that it would have been obvious to the skilled artisan to include carbon black in the barrier layer of Hunter and Spohn, in order to obtain a hose which dissipates static charge as taught by Yokoe.

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Hunter requires an ETFE non-conductive barrier layer, and a conductive ETFE innermost layer when the construct is a fuel line. Hunter does not suggest a conductive layer absent the required non-conductive barrier layer. A brief analysis of Yokoe is set forth below.

Yokoe is directed to a method for the production of a fuel hose. Yokoe discloses a fluororesin single layer inner ply containing a conductive element (col. 5, lines 19-35), or alternatively, a multi-layer inner ply where the innermost layer in contact with fuel is conductive and the outer layer of the multi-layer inner ply is non-conductive fluororesin (col. 5, lines 36-52).

It is submitted that Yokoe does not cure the deficiencies of Hunter and/or Spohn, since Yokoe does not suggest a resin tube including a body layer and a multi-layer barrier layer where the innermost layer of the barrier layer is the inside surface of the tube, and where the concentration of the adhesive component decreases from the outermost layer to the innermost layer, and the concentration of the barrier component increases from the outermost to the innermost layer of the barrier layer, as presently required. Please see the arguments set forth above regarding the rejection of the claims as obvious over Hunter and Spohn.

Further, regarding claims 7 and 8, none of the applied references, taken alone or together, suggest a multi-layer barrier layer where every layer of the multi-layer barrier layer contains a conductive element, as required.

In view of the new claims, amendments to the claims and arguments set forth herein, it is submitted that a *prima facie* case of obviousness has not been established. Further, it is submitted that nothing in Hunter, Spohn and Yokoe, taken alone or together, render the claimed invention

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obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

In view of the amendments to the claims, the new claims and the remarks set forth above, it is submitted that the claims are in condition for allowance, and early notice to that effect is earnestly solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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